

PATENT SPECIFICATION

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808.984



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COMPLETE SPECIFICATION

Pipe Joints

Wc. STEWARTS AND LLOYDS LIMITED, of 41, Oswald Street, Glasgow, C.1, a British Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to joints for pipes made from thermo-plastic materials of a kind which can be expanded by an internally applied force.

The object of the invention is to enable an effective joint between one end of a pipe of the said kind and a coupling piece to be produced in a simple and expeditious manner.

A joint in accordance with the invention between a pipe made from thermo-plastic material of the kind specified and a coupling piece, comprises a coupling piece having thereon at least one spigot adapted to be inserted in and thereby expand one end of the pipe, and a sleeve made from a hard polythene or other material of a like kind which can be expanded by an internal force and which has an inherent tendency to contract slowly after expansion, the sleeve being such that it can be placed over the pipe end before the spigot is inserted and subsequently expanded by forcing it axially over the expanded end of the pipe.

In carrying the invention into effect as illustrated by Figures 1, 2 and 3 of the accompanying drawings for interconnecting the ends of a pair of pipes *a* made from thermo-plastic material of the kind specified, there is provided a tubular coupling piece *b* which at its ends is shaped to form spigots which can be tightly inserted into the pipe ends. Preferably the spigots have formed on them sharp circumferential ridges *c* which can become embedded in the inner surfaces of the pipes. The coupling piece may be made wholly or in part from a metal, and preferably a corrosion-resisting metal, or from any convenient hard thermo-plastic or thermo-setting material, or a synthetic rubber of the

styrene-butadiene type, the latter being, however, unsuitable if the joint is to be used under warm operating conditions. In all cases the spigots are such that on insertion they cause the pipe ends to be expanded.

Prior to insertion of the spigots a closely fitting sleeve *d* is slipped over each of the pipe ends as shown in Figure 1 to a distance greater than the length of the pipe to be occupied by a spigot as shown in Figure 2. The sleeve is made from hard polythene or other material of a like kind, which can be expanded by an internal force and which after expansion tends to contract slowly. Preferably the polythene is of a grade having a molecular weight of not less than 95,000. The thickness of the sleeve depends on the size of the pipe, but in no case is it less than 0.08 inch. The sleeve may have a smooth bore, or the bore may be circumferentially ridged corresponding to the spaces between the ridges on the spigot.

After the spigots have been inserted into the pipe ends, causing the said ends to be expanded by at least 0.05 inch, as shown in Figure 2, an endwise force is applied to the sleeves by any convenient tool, causing them to be pushed over the swollen ends of the pipes and into mutual contact as shown in Figure 3. In this action the sleeves are expanded, and the subsequent slow shrinking of the sleeves causes them to squeeze the pipe ends into intimate contact with the spigots.

The material from which the sleeves are made is preferably such that after expansion on the pipe ends, their physical condition is such as would provide a minimum shrinkage of 10% of their expanded diameter if allowed to shrink freely. This may be ensured by a preliminary expansion of the sleeves before placing them on the pipes.

The shrinkage of the sleeves after they have been pushed over the expanded pipe ends may be accelerated by the application of heat at a temperature of about 100° C., as by im-

mersion in boiling water.

When the coupling pieces are made in the form of bends, elbows, tees, crosses or the like, these are provided with spigots similar to those above described and are made from any convenient material.

WHAT WE CLAIM IS:—

1. A joint between a pipe made from thermoplastic material of the kind specified and a coupling piece, comprising a coupling piece having thereon at least one spigot adapted to be inserted in and thereby expand one end of the pipe, and a sleeve made from

a hard polythene or other material of a like kind which can be expanded by an internal force and which has an inherent tendency to contract slowly after expansion, the sleeve being such that it can be placed over the pipe end before the spigot is inserted and subsequently expanded by forcing it axially over the expanded end of the pipe.

2. Jointing means for pipes made from thermo-plastic material of the kind specified, substantially as described and as exemplified by the accompanying drawings.

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PROVISIONAL SPECIFICATION

Pipe Joints

We, STEWARTS AND LLOYDS LIMITED, of 41, Oswald Street, Glasgow, C.1, a British Company, do hereby declare this invention to be described in the following statement:—

- 30 This invention relates to joints for pipes made from thermo-plastic materials of a kind which can be expanded by an internally applied force.

The object of the invention is to enable an effective joint to be formed between a pair of pipe ends, or between a pipe end and a fitting, such as an elbow, bend, tee, cross or the like, to be produced in a simple and expeditious manner.

- 40 A jointing means in accordance with the invention includes a spigot which on insertion into a pipe end can expand the said end and a sleeve adapted to embrace the pipe end tightly, the sleeve being made from polythene or other material of a like kind which can be expanded by an internal force and which after expansion has an inherent tendency to contract.

In one manner of carrying the invention into effect for interconnecting the ends of a pair of pipes made from any thermo-plastic material, there is provided a tubular coupling which at its ends is shaped to form spigots which can be tightly inserted into the pipe ends. Preferably the spigots have formed on them sharp circumferential ridges which can become embedded in the inner surfaces of the pipes. The couplings may be made wholly or in part from a metal, and preferably a corrosion-resisting metal, or from any convenient hard thermo-plastic or thermosetting material, or a synthetic rubber of the styrene-butadiene type, the latter being, however, unsuitable if the joint is to be used under warm operating conditions. In all cases the spigots are such that on insertion they cause the pipe ends to be expanded.

Prior to insertion of the spigot a closely

fitting sleeve is slipped over said pipe end to a distance greater than the length of pipe to be occupied by a spigot. The sleeve is made from polythene or other material of a like kind, which can be expanded by an internal force and which after expansion tends to contract. Preferably the polythene is of a grade having a molecular weight of not less than 95,000. The thickness of the sleeve depends on the size of the pipe, but in no case is it less than 0.08 inch. The sleeve may have a smooth bore, or the bore may be circumferentially ridged corresponding to the spaces between the ridges on the spigot.

After the spigots have been inserted into the pipe ends, causing the said ends to be expanded by at least 0.05 inch, an endwise force is applied to the sleeves by any convenient tool, causing them to be pushed over the swollen ends of the pipes. In this action the sleeves are expanded, and the subsequent slow shrinking of the sleeves causes them to squeeze the pipe ends into intimate contact with the spigots.

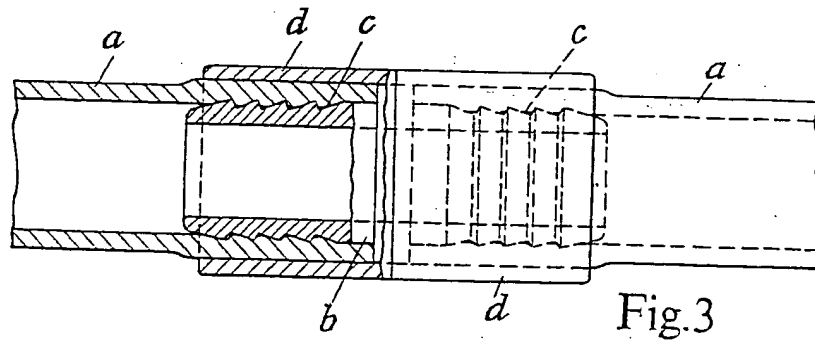
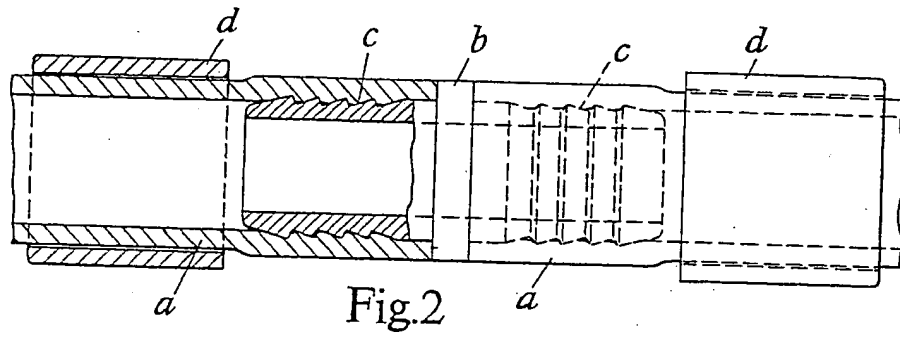
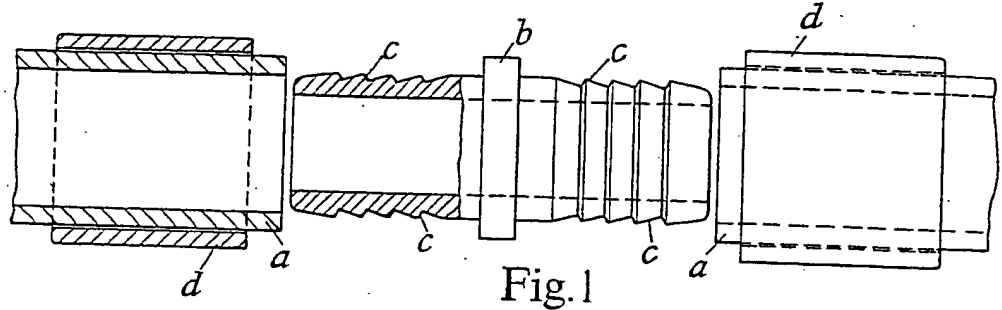
The material from which the sleeves are made is preferably such that after expansion on the pipe ends, their physical condition is such as would provide a minimum shrinkage of 10% of their expanded diameter if allowed to shrink freely. This may be ensured by a preliminary expansion of the sleeves before placing them on the pipes.

The shrinkage of the sleeves after they have been pushed over the expanded pipe ends may be accelerated by the application of heat at a temperature of about 100° C., as by immersion in boiling water.

When the coupling pieces are made in the form of bends, elbows, tees, crosses or the like, these are provided with spigots similar to those above described and are made from any convenient material.

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